

# (12) UK Patent Application (19) GB (11) 2 257 558 (13) A

(43) Date of A publication 13.01.1993

(21) Application No 9214443.5

(22) Date of filing 08.07.1992

(30) Priority data

(31) 9111514 (32) 08.07.1991 (33) KR

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(51) INT CL<sup>5</sup>

G11B 15/02, H04N 5/76 5/782

(52) UK CL (Edition L)

G5R HB789 RHX RQA

H3Q Q14 Q15

(56) Documents cited

None

(58) Field of search

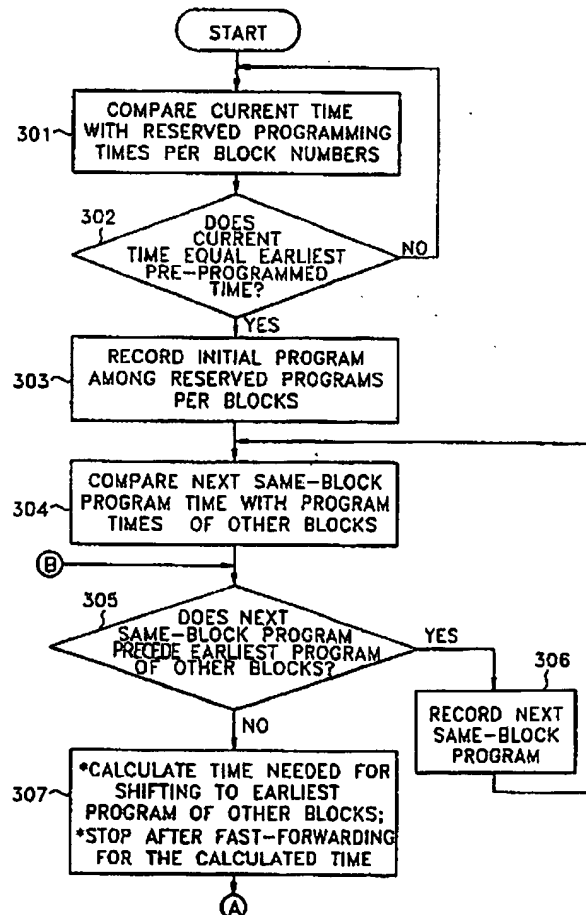
UK CL (Edition K) G5R RHX RNA RNF RQA

INT CL<sup>5</sup> G11B, H04N

(54) Video recorder operation based on program content e.g. sport or news

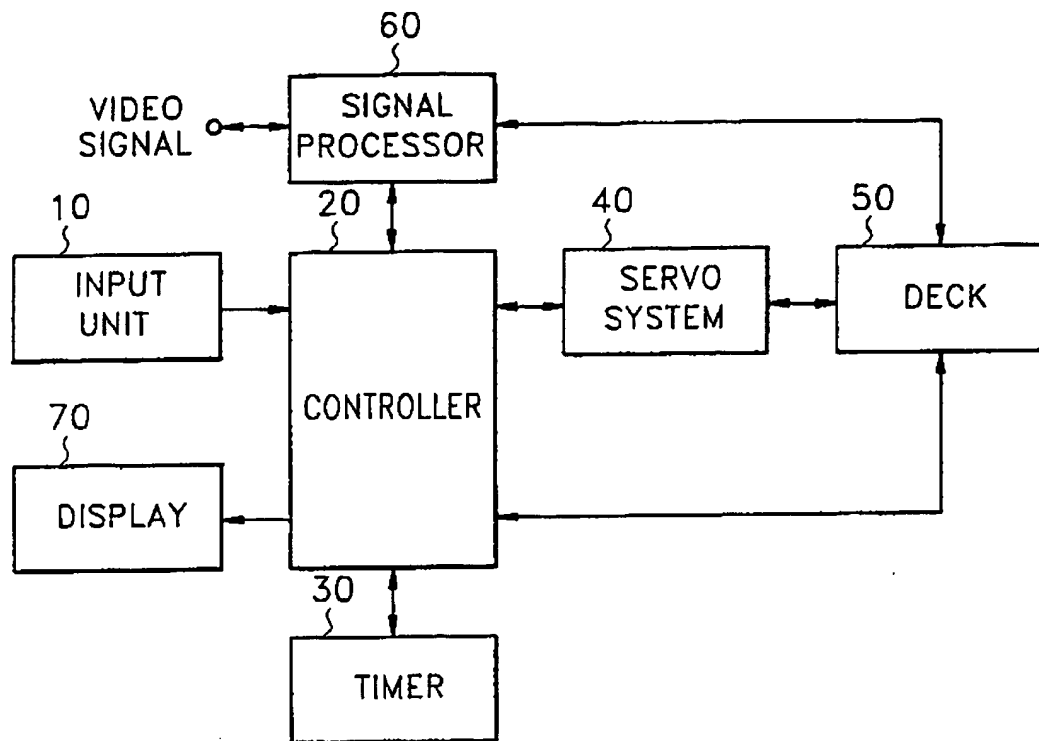
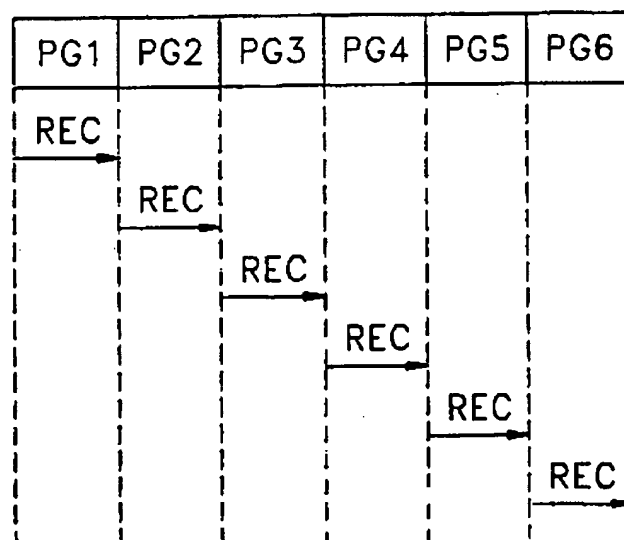
(57) A reserved recording method and apparatus perform reserved recording according to the contents of programs based on the order of reception in a VCR. When program information is reserved, a block number BLK denoting the pre programmed time and class of the program is stored in a memory. After receiving current time information through a timer, when the current time is the pre-programmed recording time, the initial program is recorded and the existence of program information having the same block number is checked. If a program of the same block number exists, the pre-programmed time of this program is compared with those of programs in other blocks, so that a FF operation is performed for as long as the predetermined tape length of the program in the same block when a program of another block is earlier. Then, a program of another block is recorded at the corresponding pre-programmed time. Also, if the program of another block is already recorded at the current position on the tape, a rewind operation is performed for as long as the tape length to the corresponding position requires, thereby recording the program at the corresponding pre programmed time. Since the locations of respective programs recorded on the tape are linked by contents, the recorded programs having a desired content can be easily selected for viewing during playback.

FIG. 3



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**FIG. 1 (PRIOR ART)****FIG. 2 (PRIOR ART)**

2/5  
**FIG. 3**

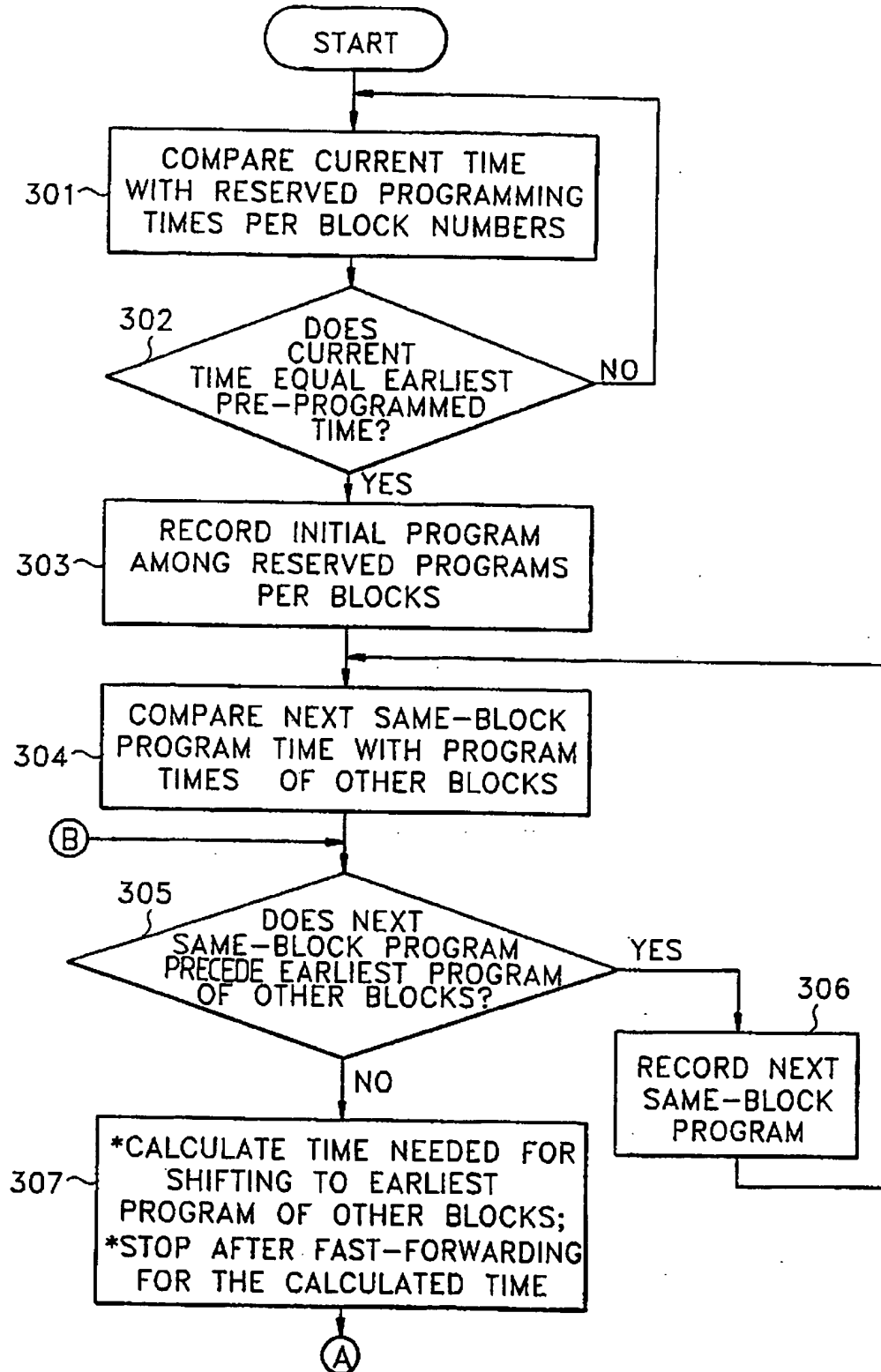


FIG. 3 (CONT'D)<sup>3/5</sup>

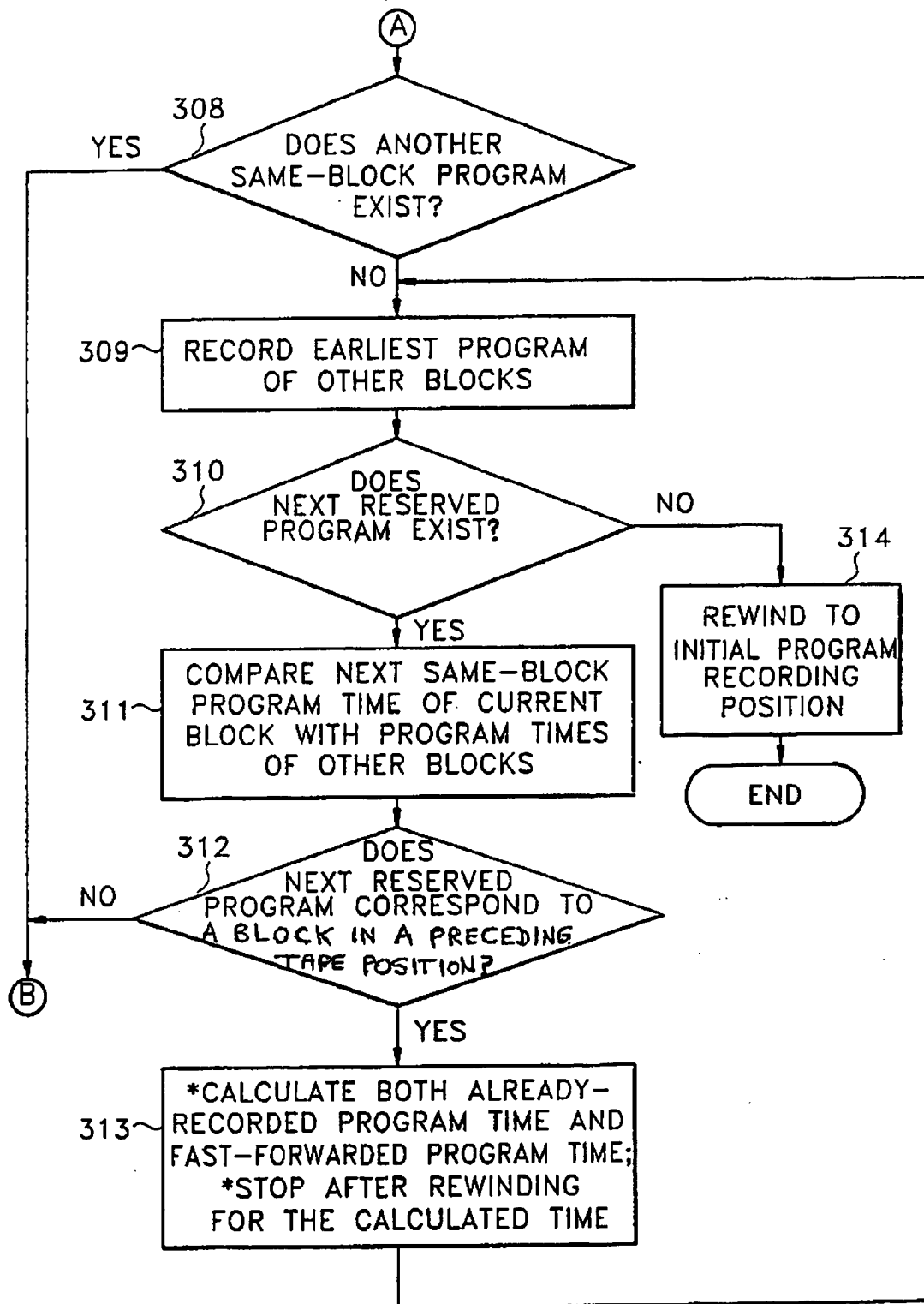


FIG. 4A

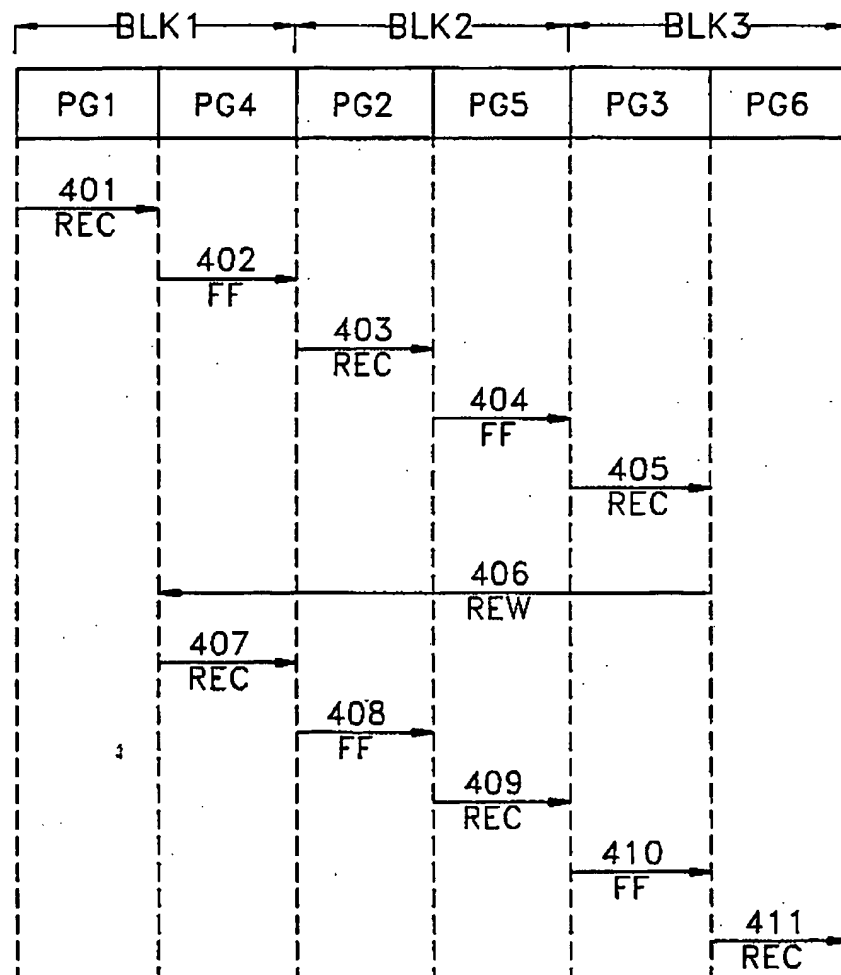
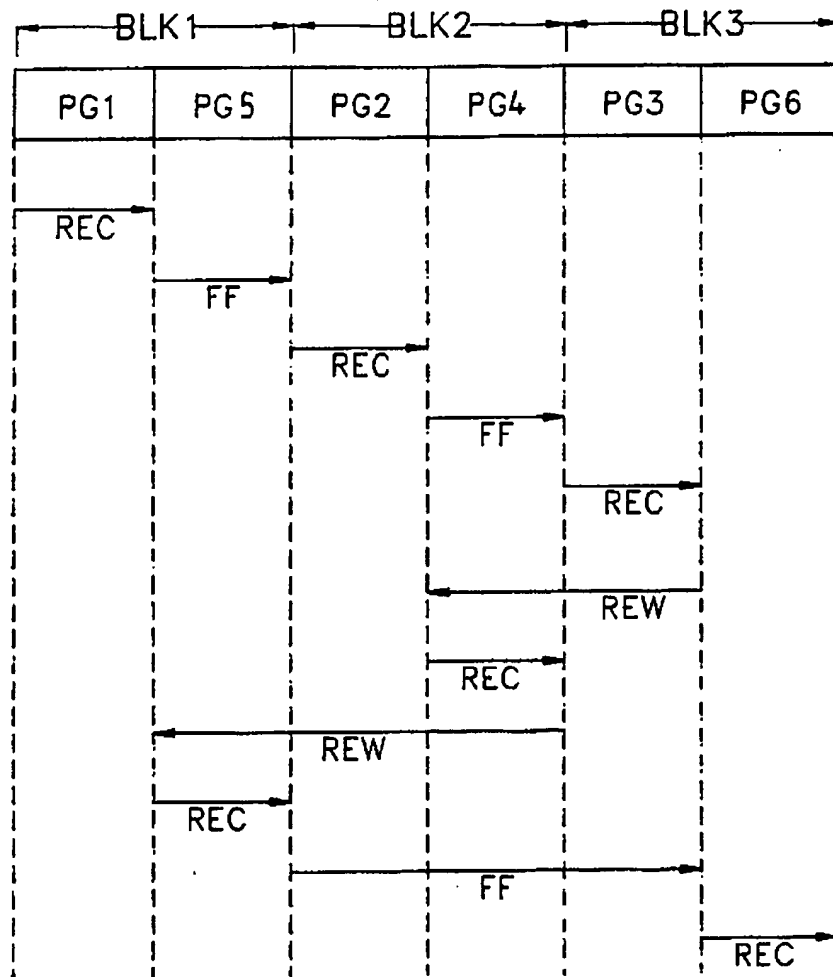


FIG. 4B



## RESERVED RECORDING METHOD AND APPARATUS

The present invention relates to a reserved recording method and apparatus in a recording apparatus.

5

Generally, video cassette recorders (VCRs) are formed as illustrated in Figure 1 of the accompanying diagrammatic drawings. The VCR illustrated in Figure 1 is well known in the art, wherein a signal processor 60 has recording and playback sections, and a servo system 40 has a capstan servo and drum servo. Also, a deck 50 mechanism is provided for performing the transport of a tape and attaching/detaching of various heads.

15 In operation, the recording section of signal processor 60 first separates a received image signal into a luma signal and a chroma signal. In order to record these signals directly on the tape, the luma signal is frequency-modulated, and the chroma signal is down converted into a frequency band below the luma signal. Then, the two signals are synthesized, and the synthesized signals are recorded on the tape through a video head of deck 50.

20 In the operation of the playback section of signal processor 60, the luma signal band of the video signal reproduced through the video head of deck 50 is FM demodulated. After filtering the signal, corresponding to the chroma signal, whose band is below the luma signal band, up-conversion is carried out to the frequency band of the original chroma signal. Thus, the two signals are synthesized, and then output on the screen or display 70.

25 Deck 50 is provided with a full-track erase head, video heads, an audio head, a control head, etc. Here, two video heads are installed on the drum

to have a phase difference of  $180^\circ$ . In addition, a drum motor for driving the drum and a capstan motor for controlling the transport of the tape are provided.

5           Accordingly, servo system 40 includes the drum servo for controlling the rotation of the drum of deck 50, and the capstan servo for controlling the transport speed of the tape in accordance with the recording operational mode command for recording pre-programmed programs in controller 20. Here, the rotational frequency of the drum motor is 30Hz, while that of the capstan  
10   motor is 1078.92Hz in a standard mode and 359.64Hz ( $1078.92\text{Hz} \div 3$ ) in an extended mode.

When reserved recording functions are intended to be carried out in a VCR system which performs the above described operation, they are recorded  
15   according to the order in which the pre-programmed programs are input to the VCR, that is, in the order of their broadcasting time. In more detail, if six programs PG1-PG6 are to be recorded, as shown in Figure 2 of the accompanying diagrammatic drawings, the recording is sequentially executed at the corresponding time according to the order in which they will be  
20   received, i.e., from PG1, PG2, PG3, PG4, PG5, to PG6. Here, assuming that programs PG1 and PG4 are sports programs, PG2 and PG5 are drama programs, and PG3 and PG6 are news, pre-programmed programs PG1-PG6 are sequentially recorded in accordance with the order of reception in the conventional method.

25

Therefore, after completing the recording, when a drama, news, and the like, i.e. when specific programs with subject-related contents are desired to be successively viewed, since these programs have not been recorded



according to classification, the viewer must search every program by pressing a VISS (Video Index Search System) or VASS (Video Address Search System) button on the VCR or via a remote controller, both of which correspond to input unit 10.

5

In other words, when the viewer wants to watch specific programs having related subject-matter after recording a plurality of programs, the disadvantage of the conventional technique is that the viewer has to hunt through all of the recorded programs to find specific programs, using the  
10 VISS or VASS function in a high-speed mode such as fast-forward (FF) or rewind (REW).

Preferred embodiments of the present invention aim to solve the above described problem. Accordingly, it is an aim to provide a reserved recording  
15 method in a video recording/reproducing apparatus, wherein pre programmed programs can be recorded in accordance with their contents, when carrying out reserved recording of a plurality of programs.

It is another aim to provide a reserved recording method in a video  
20 recording/reproducing apparatus, wherein pre-programmed programs are classified according to their contents and recorded on a section of tape corresponding to the contents based on the reserved order, when carrying out reserved recording of a plurality of programs.

25 It is still another aim to provide a reserved recording apparatus in a video recording/reproducing apparatus which can record pre programmed programs in accordance with their contents, when carrying out reserved recording of a plurality of programs.

Embodiments of the present invention provide a reserved recording method and apparatus in a video recording/reproducing apparatus having a reservation function, wherein programs are recorded by the reservation function by classes in accordance with their contents, while being based upon the order of reception. For this operation, when program information is reserved, a block number which designates the class of the program and a pre-programmed time are stored in a memory. Then, after receiving current time information through a timer, when the current time is the pre-programmed recording time, the initial program is recorded and the existence of program information having the same block number is checked. At this time, if a program of the same block number exists, the pre programmed time of this program is compared with those of the programs in other blocks, so that a FF function is performed for as long as the predetermined tape amount of the program in the same block when a program of another block is earlier. Thus, space is reserved on the recording medium for recording the or each other program of the same block number. Thereafter, the program of another block is recorded at the corresponding pre-programmed time. Also, if the program of another block is already recorded on the current position of the tape, the REW function is performed for as long as the tape length of the corresponding program requires, thereby recording the program at the corresponding pre-programmed time. By doing so, the program is recorded based upon the corresponding pre-programmed time, while the locations of respective programs on the tape are set according to their contents.

According to one aspect of the present invention, there is provided a reserved recording method in a recording apparatus for inputting respective block numbers which designate the content of programs during reserving the

recording of said programs, and storing the reserved programs per blocks in an internal memory, the method comprising the steps of:

5 receiving current time information, and recording a program whose pre-programmed time is the earliest among said reserved programs;

comparing the pre-programmed time of the next program in the same block with those of programs in other blocks;

10 waiting until said pre-programmed time of said next program when said pre-programmed time of said next program in the same block is the earliest among those of said programs in other blocks, recording said next program, and repeating said comparing step;

15 calculating the length of a section from the reserved recording section of said next program in the same block to the starting point of a corresponding program in another block, when the pre-programmed time of said program in another block is earlier than that of said next program in the same block in said comparing step, and shifting to the recording position of  
20 said corresponding program by carrying out a fast forward (FF) function for the duration of said calculated section; recording said corresponding program in another block;

analyzing each pre-programmed time of said next program in the block  
25 of said recording step and said programs in other blocks;

proceeding to said comparing step when a program of the following pre-programmed time does not belong to said already-recorded block in said analyzing step; and

5 performing a REW function for the duration of the sections where the recording and FF operations have already been carried out, when the pre-programmed time of already recorded program in other blocks in said analyzing step, and proceeding to said recording step.

10 Preferably, in said comparing step, the rotational frequency signal of a capstan wheel is counted until reaching the starting point of the recording of said program in another block when the pre-programmed time of said program in another block is earlier, and the recording point is shifted as much.

15 Preferably, in said analyzing step, the pre-programmed time of said next program corresponds to said sections where the recording and FF operations have already been carried out, and is calculated by counting the pulses of a control signal having a predetermined frequency.

20 According to another aspect of the present invention, there is provided a reserved recording method in a recording apparatus comprising the steps of:

receiving each pre-programmed time and block numbers according to  
25 contents of programs, and storing them;

receiving current time information through a timer, and checking said recording time of a reserved program;

recording a reserved program corresponding to said current time when said current time is the recording time in said recording time checking step;

5      checking for the existence of another reserved program having the same block number;

10      comparing with the pre-programmed time of other programs having other block numbers, when another reserved program having the same block number exists in said reserved program checking step;

15      proceeding to said recording time checking step after recording the corresponding program, when the pre programmed time of said reserved program having the same block number is the earliest among other programs having other block numbers in said comparing step;

20      performing a FF (fast forward) function through the recording section of said reserved program having the same block number, and shifting to the position of the reserved program having another block number, and proceeding to said recording time checking step, when the pre-programmed time of said reserved program having another block number is earlier than said program having the same block number in said comparing step;

25      reading time information of the earliest reserved program having another block number when there is no reserved program having the same block number in said reserved program checking step; and

shifting to the recording position of said corresponding reserved program having a corresponding block number by performing a FF function, and proceeding to said recording time checking step.

- 5            Preferably, said step of proceeding to the recording position of said reserved program by performing a FF function comprises the steps of:

checking whether or not the next reserved program has an already-recorded block number;

10

shifting to the recording position of the corresponding reserved program by performing a FF operation, when said block number of said program is the same as that of an unrecorded block or the same block in said checking step; and

15

shifting to the recording position of said corresponding reserved program by performing a REW operation, when said next reserved program has an already-recorded block number.

- 20            Preferably, in said comparing step, said section to the recording starting point of said program having another block number is shifted by counting the rotational frequency signal of a capstan wheel in said section, when the pre-programmed time of said program having another block number is earlier than that having the same block number.

25

Preferably, in said checking step, said shifting section of said corresponding reserved program by performing a REW operation is calculated

by counting the pulses of a control signal having a predetermined frequency, when said program has said already recorded block number.

5 According to a further aspect of the present invention, there is provided a reserved recording apparatus in a recording apparatus, for controlling the recording reservation of a program, the reserved recording apparatus comprising:

10 information input means for inputting a pre programmed time and block number per contents of programs;

memory means for storing each pre-programmed time and block numbers per contents of said programs; controlling means which receives a current time information through a timer, and checks each recording time of reserved programs, thereby controlling the recording location of each program according to said contents based upon its pre-programmed time; and

15 servo means for recording said programs on a recording medium according to said contents under the control of said controlling means.

20 Preferably, said controlling means counts the frequency of a capstan frequency generator of said servo means, and controls said servo means to perform a FF operation up to the recording position of a corresponding reserved program, and to record said corresponding reserved program, when

25 said program whose time has reached the pre-programmed time is of an unrecorded block or the same block.

Preferably, said controlling means counts the pulses of a control signal having a predetermined frequency and controls said servo means to perform a REW operation up to the position of a corresponding reserved program and to record said corresponding reserved program, when said program has an  
5 already-recorded block number.

According to another aspect of the present invention, there is provided a method for carrying out recordings on a recording medium of programs which are to be output at different respective times, the method comprising  
10 the steps of:

inputting a plurality of data entries, each identifying a respective program time and program category of a program that has been selected to be recorded; and  
15

recording the programs on said recording medium in a sequence in which, in the event that there are a plurality of programs of the same category, all programs of that category are recorded one after the other in a common area of the recording medium.  
20

According to another aspect of the present invention, there is provided apparatus for carrying out recordings on a recording medium of programs which are to be output at different respective times, the apparatus comprising:

25 means for inputting a plurality of data entries, each identifying a respective program time and program category of a program that has been selected to be recorded; and



means for recording the programs on said recording medium in a sequence in which, in the event that there are a plurality of programs of the same category, all programs of that category are recorded one after the other in a common area of the recording medium.

5

A method or apparatus as above may further comprise any one or more of the features disclosed in the accompanying specification, claims, abstract and/or drawings, in any combination.

10        A method or apparatus according to any of the preceding aspects of the invention, may advantageously be for the reserved recording of video programs.

15        The invention extends to recording or recording/reproducing apparatus provided with a reserved recording apparatus, or adapted to perform a reserved recording method, according to any of the preceding aspects of the invention.

20        Such recording or recording/reproducing apparatus may comprise a video tape recorder.

25        For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to Figures 3 and 4 of the accompanying diagrammatic drawings, in which:

Figure 3 is a flowchart showing one example of a reserved recording method according to the present invention; and

Figures 4A and 4B illustrate the order of reserved recording carried out according to the reserved recording method of Figure 3.

5 Except for controller 20, the construction of a VCR system for performing the method of Figure 3 may be identical to that shown in Figure 1.

10 The Figure 3 flowchart illustrates the recording process by classifying reserved programs in accordance with their contents, based upon the order of reception.

Figures 4A and 4B illustrate the recorded order of each reserved program at the corresponding pre programmed time, when the recording is reserved by classifying the programs according to their contents.

15

Hereinafter, an example of the present invention will be described in detail with reference to Figures 1, 3 and 4.

20 To begin with, the viewer selects programs which will be reserved, and inputs information about the selected programs according to each pre-programmed time. At this time, the input information includes time information, channel information, a tape mode during recording, a block number (BLK) for each program, etc. Here, the tape mode designates the recording mode to be for standard play (SP) or extended play (EP), and the  
25 block number is a number corresponding to the content (subject matter) of individual programs. By repeating the foregoing process for each program to be recorded by the program reservation function, all of the programs are then classified according to content. The reservation information may be input

through a keypad, or some other suitable input device, associated with the input unit 10. Then, controller 20 receives reserved information through input unit 10, and allocates block addresses in the internal memory area, thereby storing the information corresponding to the reserved programs per blocks. Here, the information received during the reserving process of the blocks and programs is assumed as shown in Table 1 below.

Program	Reserved time	Block number	Content
PG1	9:00-10:00	BLK1	sports
PG2	11:00-11:30	BLK2	news
PG3	12:00-13:00	BLK3	drama
PG4	14:00-15:00	BLK1 (2)	sports
PG5	16:00-17:00	BLK2 (1)	news
PG6	18:00-19:00	BLK3	drama

After reserving the programs according to their contents as described above, the process for recording the reserved programs according to their contents while being based upon the pre-programmed order will be described below, with reference to Figure 3.

First, controller 20 receives the current time from a timer 30 and compares this with each pre programmed time of the programs per block numbers stored in the internal memory (step 301). Then, the earliest pre-programmed time among the reserved programs per blocks is checked so as to determine whether the current time has reached a recording time (step 302).

Here, if the current time is not that of a reserved program. The program returns to step 301 to await the time of the earliest reserved program.

5       When the current time received from timer 30 reaches the recording time of the initially reserved program in step 302, the channel is tuned to the selected channel of the corresponding reserved program, servo system 40 and deck 50 are set to the recording mode, and the initially reserved program of the corresponding block number is recorded (step 303). The video signal is supplied to the video head of deck 50 through the recording section of signal processor 60. At this time, as shown in the foregoing Table 1, the recorded program is PG1, and step 303 carries out the recording on the tape for one hour.

15       After recording the program whose pre-programmed time is the first among the programs per block numbers, controller 20 confirms whether or not another program of the same block exists among the reserved programs per block numbers which are stored in the internal memory. Then, if one or more reserved programs of the same block number do exist, the earliest is selected and this program is compared with a program whose reserved time is the earliest among the reserved programs of other block numbers which are designated in the internal memory (step 304). The pre-programmed time of the earlier reserved program having the same (current) block number is checked so as to determine whether it precedes that of the earliest program of the other block numbers (step 305). If the pre-programmed time of the program having the same block number is earlier, the next reserved program in that block is recorded at the appropriate time (step 306). When the step 306 recording is completed, the program returns to step 304.

In step 305, if the pre-programmed time of the next reserved program of the same block is later than that of the earliest reserved program of the other block numbers (or if no other reserved program exists for the same block number), the time required for shifting to the recording position of the next reserved program in a corresponding other block is calculated. Servo system 40 then operates deck 50 in the fast-forward (FF) mode for the calculated time, and stops deck 50 at the recording position of the corresponding reserved program (step 307). Here, the duration of the FF operation corresponds to the total recording time of the or each further program reserved for the current block. Then, checking for the existence of another reserved program of the same block number is carried out (step 308). If one exists, the program returns to step 305 and repeats steps 305 to 307.

In other words, after program PG1, since the next reserved program in the same block (BLK1) is PG4 as shown in Table 1, controller 20 checks the pre programmed time of program PG4 of block BLK1 and the pre programmed time of the reserved programs (PG2, PG3, PG5, and PG6) of the other blocks (BLK2 and BLK3) in step 305.

At this time, since the pre-programmed time of program PG2 of BLK2 is earlier than that of the next program PG4 of the already-recorded-in block BLK1 (step 305), the FF function is performed from the position of currently recorded program PG1 to the starting position for program PG2, passing over the reserved interval of program PG4 corresponding to block BLK1 in step 306.

Also, while driving deck 50 in the FF mode through controller 40 in step 307, the shifting time is calculated using the output of an unshown

capstan frequency generator (hereinafter referred to as a "CFG")- That is, servo system 40 is composed of the capstan servo and drum servo, wherein the capstan servo controls the transport speed of the tape. At this time, a CFG signal includes the rotational frequency of the capstan wheel, which is  
5 1078.92Hz in the SP mode. Thus, controller 20 stores the pre-programmed time of each program in its internal memory, so that the time of the program which will be recorded next is calculated while performing high-speed functions (FF or REW). Then, the CFG signal received through servo system 40 is counted while deck 50 is operated in the FF mode, thereby proceeding  
10 to the recording position of the next program.

When the non-existence of the next reserved program included in the same block is determined in step 308 through the above-described process, controller 20 receives current time information via timer 30, sets deck 50 to  
15 the recording mode, and controls servo system 40 to operate deck 50 in a normal speed mode, upon reaching the pre-programmed time of the corresponding program (step 309).

In other words, considering the above Table 1, step 309 is the process  
20 wherein, after recording program PG1, and after the FF operation is carried out for the duration of the pre-programmed time interval of program PG4 which belongs to the same block (BLK1) as program PG1, than program PG2 whose pre-programmed time is the earliest among the programs included in the other blocks (BLK2 and BLK3) is recorded.

25

After this, controller 20 checks for the existence of a next reserved program (step 310), compares the time of the next program to be recorded in the same block (here, BLK2) with the time of the programs in the other

blocks (BLK1 and BLK3) when another reserved program exists (step 311), and checks whether or not the next program has a block number that corresponds to a program that has been recorded (step 312). If not, the program returns to step 305 and repeats steps 305.

5

Referring to Table 1, after recording program PG2 included in block BLK2 in step 309, the pre-programmed time of program PG5 included in the same block BLK2 is compared with each pre-programmed time of programs PG4, PG3, PG6 included in blocks BLK1 and BLK3, respectively.

10

Here, since the pre-programmed time of program PG3 is earlier than that of program PG5, it is recognized that the next reserved program PG3 is not a program in one of the already recorded blocks BLK1 and BLK2 in step 312, and the program returns to step 305.

15

Accordingly, controller 20 repeats steps 305 through 309 to perform the FF operation for the duration of the pre-programmed time of program PG5, and thereafter records the content of program PG3 at its pre-programmed time.

20

After recording program PG3 of block BLK3, when the pre-programmed time of the other program PG6 in block BLK3 is compared with those of programs PG4 and PG5 each included in other blocks BLK1 and BLK2 in step 311, it is noted that the pre-programmed time of program PG4 included in block BLK1, in which a reserved recording function has already  
25 been carried out, is earlier than that of program PG6. Thus, in step 313, controller 20 calculates each program time of the blocks in which the reserved recording has already been carried out, in an earlier tape position, as well as

each reserved program time by-passed the FF mode. Then, deck 50 is set to the REW mode and through servo system 40, performs a rewind function, to stop at the position of the corresponding reserved program.

5           Thereafter, controller 20 receives the time information of timer 30, thereby recording the corresponding program PG4 in step 309, when the current time is the pre-programmed time of the corresponding program.

          The above described steps are repeated to record programs PG5 and  
10 PG6 (respective steps 309), following respective FF operations (step 307).

          By repeating the reserved recording, when the last program is recorded, controller 20 recognizes the final recording in step 310 and controls servo system 40 to operate deck 50 in the REW mode, thereby shifting to the  
15 initial program recording position and completing the program (step 314).

          When the above-described process is carried out, after the programs are reserved per blocks as shown in Table 1, the recording is performed based on the reserved order of each program, as illustrated in Figure 4A. Meanwhile,  
20 it can be noted that the programs recorded on the tape are reproduced per blocks.

          That is, if controller 20 recognizes the pre programmed time of program PG1 in step 302, program PG1 is recorded (401) in step 303, and,  
25 since each pre-programmed time of programs PG2 and PG3 (being of other blocks) are earlier than that of program PG4 included in block BLK1 in step 304, the tape is transported by performing a FF operation (402) to allow



program PG4 to be recorded following program PG1, which belongs to the same block in step 307.

5       Program PG2 is next recorded (403), and the tape is then transported by an FF operation (404) to leave a tape section on which program PG5 can later be recorded.

Program PG3 is then recorded (405) the pre programmed times of PG6, PG4, and PG5 are compared with one another in step 311.

10

Then, step 312 recognizes that the pre-programmed time of program PG4 is earlier than those of PG5 and PG6, and the REW function is performed (406) until the preset position on the tape is reached, whereupon program PG4 is recorded (407) following program PG1 of block BLK1 in  
15   step 313. After recording program PG4, a FF operation is performed (408) throughout the recording section of program PG2 of block BLK2, and program PG5 of block BLK2 is recorded (409) following program PG2. Then, the FF function is again performed (410) throughout the recording section of program PG3 of block BLK2, and finally program PG6 of block  
20   BLK3 is recorded (411) following program PG3.

Figure 4B shows an alternative sequence of reserved recording when the programs of the example of Table 1 are in different block combinations. That is, programs PG1 and PG5 are in block BLK1, PG2 and PG4 in block  
25   BLK2, and PG3 and PG6 in block BLK3. The times of the programs PG1 to PG6 are as in Table 1.

Thus, when controller 20 recognizes the pre-programmed time of program PG1 in step 302, program PG1 is recorded in step 303, and, since the pre programmed time of program PG5 included in block BLK1 is later than those of other-block programs PG2 and PG3 in step 304, the tape is transported by performing a FF operation to allow program PG5 to be recorded following program PG1 in step 307.

Program PG2 is next recorded, and the tape is then transported by an FF operation to leave a tape section on which program PG4 can later be recorded.

Program PG3 is then recorded in step 309, and the pre programmed times of programs PG6, PG5, and PG4 are compared with one another in step 311.

In step 312, it is recognized that the pre programmed time of program PG4 is the earliest, and the section of the tape where a position is already set is reached by a rewinding operation in step 313, so that program PG4 is recorded following program PG2 of block BLK2. After recording PG4, the recording section of PG5 is passed by carrying out a REW operation, and program PG5 of block BLK1 is recorded following program PG1. Then, the recording sections of programs PG2, PG4 and PG3 of blocks BLK2 and BLK3 are passed by carrying out another FF operation, so that program PG6 of block BLK3 is recorded following program PG3.

In the above-described reserved recording methods and apparatus, the programs are recorded based upon the preset reserved order in a video recording/reproducing apparatus. Since the locations of respective programs

recorded on the tape are linked per their contents, the recorded programs having the desired content can be easily selected for viewing during playback.

5 Flowcharts other than that illustrated in Figure 3 may be applied to embodiments of the invention. For example, the decision box 308 of Figure 3 may be omitted, or placed in an alternative position (e.g. before decision box 305 or box 304). If omitted, its function may be incorporated in that of decision box 304 or 305.

10 Although video tape cassettes are by far the most popular recording medium for video signals at the present time, it is possible to apply the present invention to recording apparatus employing alternative recording media. Thus the term "video cassette" is used conveniently herein to denote any suitable recording medium for a video signal, and is to be construed  
15 accordingly.

The invention may be applied also to the recording of signals other than video signals - e.g. audio and/or radio signals.

20 The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

25

All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except

combinations where at least some of such features and/or steps are mutually exclusive.

Each feature disclosed in this specification (including any  
5 accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

10.

The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any  
15 novel combination, of the steps of any method or process so disclosed.

CLAIMS:

1. A reserved recording method in a recording apparatus for inputting  
respective block numbers which designate the content of programs during  
5 reserving the recording of said programs, and storing the reserved programs  
per blocks in an internal memory, the method comprising the steps of:

receiving current time information, and recording a program whose  
pre-programmed time is the earliest among said reserved programs;

10

comparing the pre-programmed time of the next program in the same  
block with those of programs in other blocks;

- 15 waiting until said pre-programmed time of said next program when said  
pre-programmed time of said next program in the same block is the earliest  
among those of said programs in other blocks, recording said next program,  
and repeating said comparing step;

- 20 calculating the length of a section from the reserved recording section  
of said next program in the same block to the starting point of a  
corresponding program in another block, when the pre-programmed time of  
said program in another block is earlier than that of said next program in the  
same block in said comparing step, and shifting to the recording position of  
said corresponding program by carrying out a fast forward (FF) function for  
25 the duration of said calculated section; recording said corresponding program  
in another block;

analyzing each pre-programmed time of said next program in the block of said recording step and said programs in other blocks;

5 proceeding to said comparing step when a program of the following pre-programmed time does not belong to said already-recorded block in said analyzing step; and

10 performing a REW function for the duration of the sections where the recording and FF operations have already been carried out, when the pre-programmed time of already recorded program in other blocks in said analyzing step, and proceeding to said recording step.

2. A reserved recording method as claimed in claim 1, wherein, in said comparing step, the rotational frequency signal of a capstan wheel is counted  
15 until reaching the starting point of the recording of said program in another block when the pre-programmed time of said program in another block is earlier, and the recording point is shifted as much.

3. A reserved recording method as claimed in claim 1 or 2, wherein, in  
20 said analyzing step, the pre-programmed time of said next program corresponds to said sections where the recording and FF operations have already been carried out, and is calculated by counting the pulses of a control signal having a predetermined frequency.

25 4. A reserved recording method in a recording apparatus comprising the steps of:

receiving each pre-programmed time and block numbers according to contents of programs, and storing them;

receiving current time information through a timer, and checking said  
5 recording time of a reserved program;

recording a reserved program corresponding to said current time when said current time is the recording time in said recording time checking step;

10 checking for the existence of another reserved program having the same block number;

comparing with the pre-programmed time of other programs having other block numbers, when another reserved program having the same block  
15 number exists in said reserved program checking step;

proceeding to said recording time checking step after recording the corresponding program, when the pre programmed time of said reserved program having the same block number is the earliest among other programs  
20 having other block numbers in said comparing step;

performing a FF (fast forward) function through the recording section of said reserved program having the same block number, and shifting to the position of the reserved program having another block number, and  
25 proceeding to said recording time checking step, when the pre-programmed time of said reserved program having another block number is earlier than said program having the same block number in said comparing step;

reading time information of the earliest reserved program having another block number when there is no reserved program having the same block number in said reserved program checking step; and

5           shifting to the recording position of said corresponding reserved program having a corresponding block number by performing a FF function, and proceeding to said recording time checking step.

5.       A reserved recording method as claimed in claim 4, wherein said step  
10 of proceeding to the recording position of said reserved program by performing a FF function comprises the steps of:

checking whether or not the next reserved program has an already-recorded block number;

15

shifting to the recording position of the corresponding reserved program by performing a FF operation, when said block number of said program is the same as that of an unrecorded block or the same block in said checking step; and

20

shifting to the recording position of said corresponding reserved program by performing a REW operation, when said next reserved program has an already-recorded block number.

25       6.       A reserved recording method as claimed in claim 4 or 5, wherein, in said comparing step, said section to the recording starting point of said program having another block number is shifted by counting the rotational frequency signal of a capstan wheel in said section, when the pre-programmed



time of said program having another block number is earlier than that having the same block number.

5 7. A reserved recording method as claimed in claim 5 or claims 5 and 6, wherein, in said checking step, said shifting section of said corresponding reserved program by performing a REW operation is calculated by counting the pulses of a control signal having a predetermined frequency, when said program has said already recorded block number.

10 8. A reserved recording apparatus in a recording apparatus, for controlling the recording reservation of a program, the reserved recording apparatus comprising:

15 information input means for inputting a pre programmed time and block number per contents of programs;

memory means for storing each pre-programmed time and block numbers per contents of said programs; controlling means which receives a current time information through a timer, and checks each recording time of reserved programs, thereby controlling the recording location of each program according to said contents based upon its pre-programmed time; and

20

servo means for recording said programs on a recording medium according to said contents under the control of said controlling means.

25

9. A reserved recording apparatus as claimed in claim 8, wherein said controlling means counts the frequency of a capstan frequency generator of said servo means, and controls said servo means to perform a FF operation

up to the recording position of a corresponding reserved program, and to record said corresponding reserved program, when said program whose time has reached the pre-programmed time is of an unrecorded block or the same block.

5

10. A reserved recording apparatus as claimed in claim 8, wherein said controlling means counts the pulses of a control signal having a predetermined frequency and controls said servo means to perform a REW operation up to the position of a corresponding reserved program and to record said  
10 corresponding reserved program, when said program has an already-recorded block number.

11. A reserved recording method substantially as hereinbefore described with reference to Figure 3 of the accompanying drawings.

15

12. A reserved recording apparatus substantially as hereinbefore described with reference to Figure 1 and 5 of the accompanying drawings.

13. A method for carrying out recordings on a recording medium of  
20 programs which are to be output at different respective times, the method comprising the steps of:

inputting a plurality of data entries, each identifying a respective  
program time and program category of a program that has been selected to be  
25 recorded; and

recording the programs on said recording medium in a sequence in which, in the event that there are a plurality of programs of the same

category, all programs of that category are recorded one after the other in a common area of the recording medium.

- 5 14. Apparatus for carrying out recordings on a recording medium of programs which are to be output at different respective times, the apparatus comprising:

means for inputting a plurality of data entries, each identifying a respective program time and program category of a program that has been  
10 selected to be recorded; and

means for recording the programs on said recording medium in a sequence in which, in the event that there are a plurality of programs of the same category, all programs of that category are recorded one after the other  
15 in a common area of the recording medium.

- 15 15. A method or apparatus according to claim 13 or 14, further comprising any one or more of the features disclosed in the accompanying specification, claims, abstract and/or drawings, in any combination.

20

16. A method or apparatus according to any of the preceding claims, for the reserved recording of video programs.

- 25 17. Recording or recording/reproducing apparatus provided with a reserved recording apparatus, or adapted to perform a reserved recording method, according to any of the preceding claims.

18. Recording or recording/reproducing apparatus according to claims 16 and 17, comprising a video tape recorder.

- 31 -

**Patents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)**

Application number  
 GB 9214443.5

**Relevant Technical fields**

(i) UK Cl (Edition K<sub>1</sub>) G5R (RHX, RNF, RNA, RQA)  
 (ii) Int Cl (Edition 5) G11B; H04N

**Search Examiner**

MR P R SLATER

**Databases (see over)**

(i) UK Patent Office

(ii)

**Date of Search**

25 SEPTEMBER 1992

Documents considered relevant following a search in respect of claims

ALL

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

Category	Identity of document and relevant passages	Relevance to claim(s)

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